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Mutagenicity and aromatic amine content of fumes from heated cooking oils produced in Taiwan.

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According to toxicological studies, there are several unidentified mutagens derived from cooking oil fumes appearing in kitchens of Chinese homes where women daily prepare food. Data are limited to an analysis of aromatic amines from cooking oil fumes, which are known to be carcinogenic for bladder cancer. Fume samples from three different commercial cooking oils frequently used in Taiwan were collected and analysed for mutagenicity in the Salmonella/microsome assay. Aromatic amines were extracted from the samples and identified by HPLC and confirmed by gas chromatography/mass spectrometry (GC/MS). Extracts from three cooking oil fumes were found to be mutagenic in the presence of S-9 mix. All samples contained 2-naphthylamine (2-NA) and 4-aminobiphenyl (4-ABP). Concentrations of 2-NA and 4-ABP were 31.5 and 35.7 microg/m3 in fumes from sunflower oil, 31.9 and 26.4 mg/m3 in vegetable oil, and 48.3 and 23.3 microg/m3 in refined-lard oil, respectively. Mutagenicities of the three cooking oil condensates were significantly reduced ($P<0.05$) by adding the antioxidant catechin (CAT) into the oils before heating. Significant difference existed between the amounts of aromatic amines with and without adding CAT ($P<0.05$). These results indicate that exposure to cooking oil fumes in Taiwan might be an important but controllable risk factor in the aetiology of bladder cancer.

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